

Test of Large area planar GEM

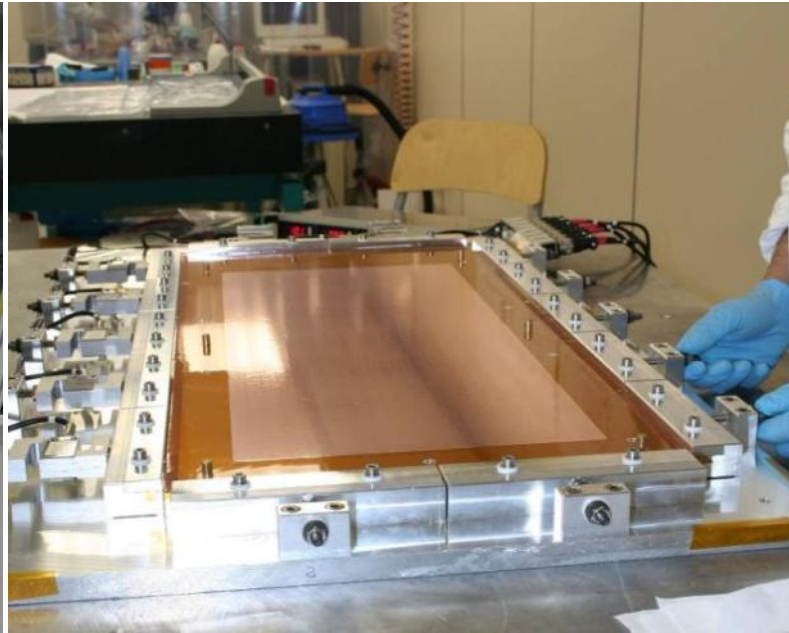
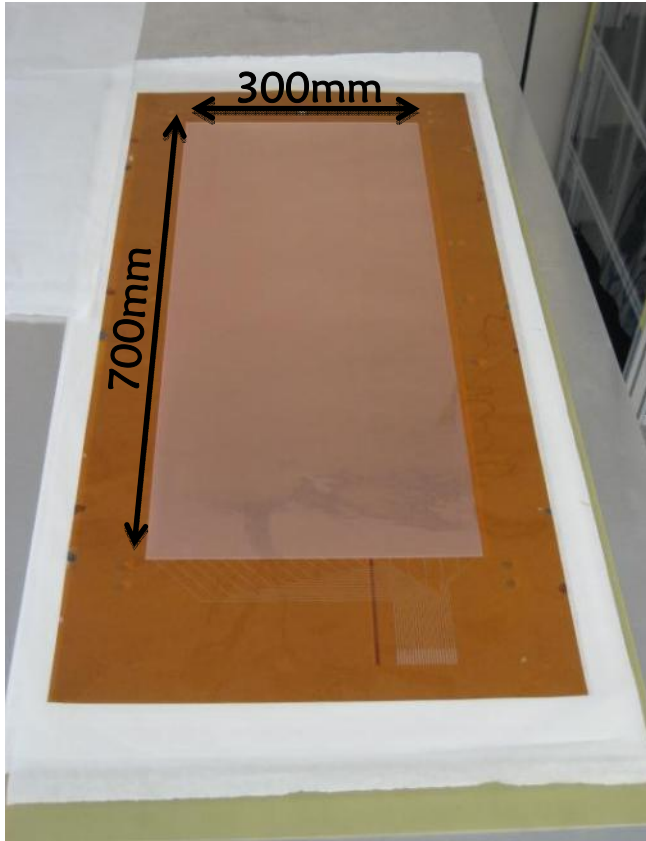
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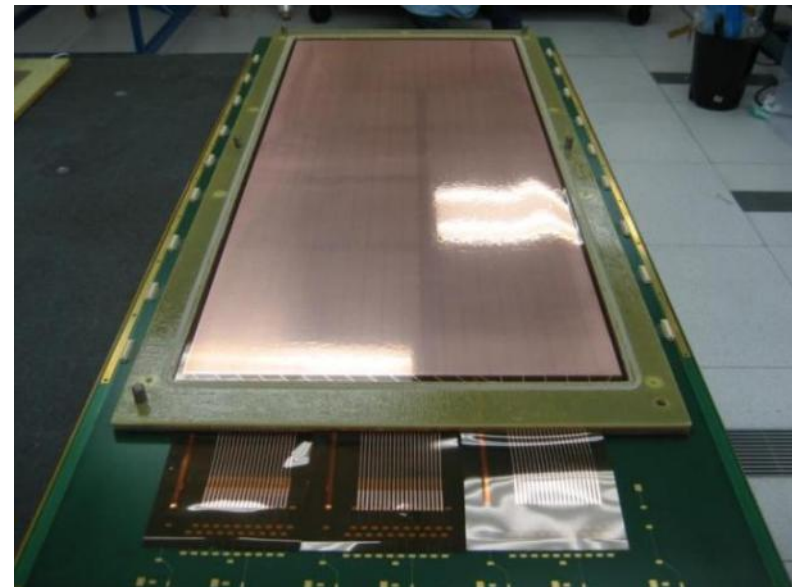
- Large area planar GEM and Experimental set
- Test of electron transparency
- Test of gas gain

1. Large planar prototype



GEM are stretched on a custom-made machine with a tension of $\sim 1\text{kg/cm}$ measured by load-cells

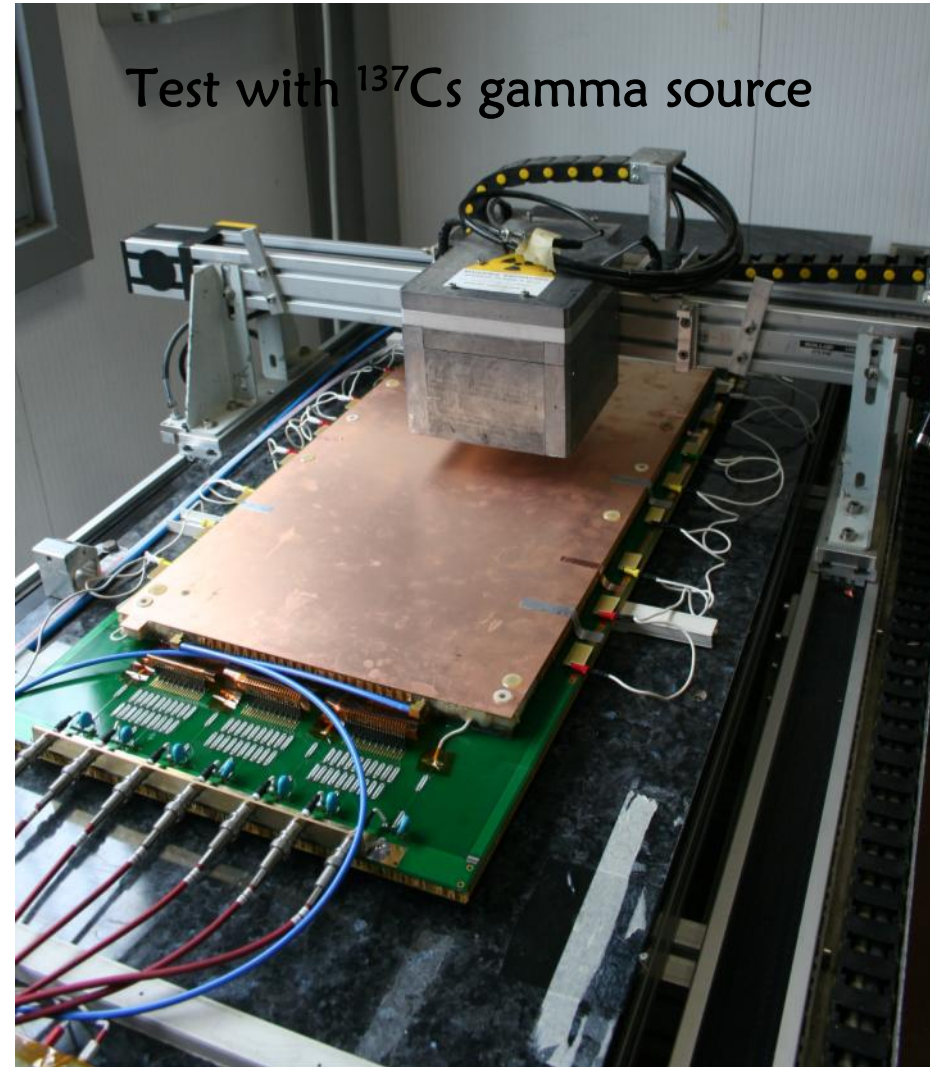
FR4 frame is glued on the GEM in a vacuum-bag
The result is a **planar foil** ($20\ \mu\text{m}$ sag) with no need of frames inside the active area



Experimental set

The detector has been flushed with **Ar/CO₂ (70/30)** and tested in current-mode with a **¹³⁷Cs source** (660 keV photons, **1.1758GBq**)

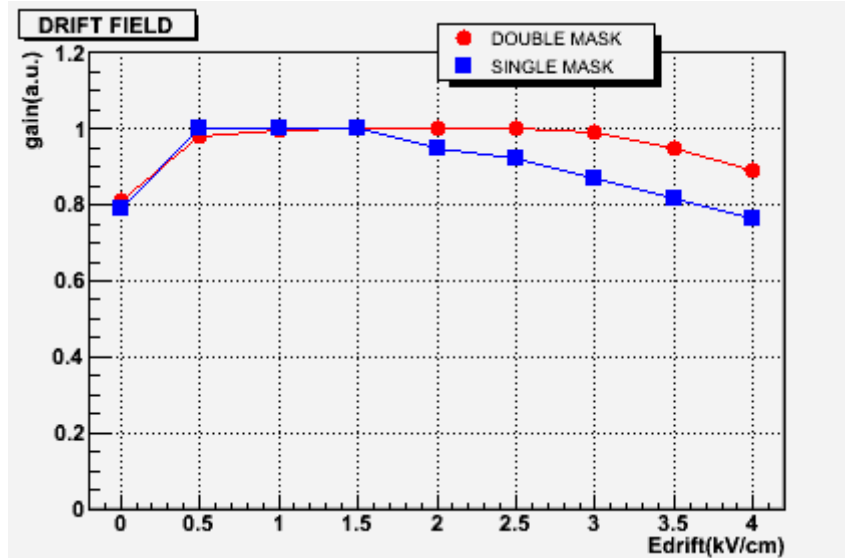
A 10x10 cm² chamber with double-mask foils has been used for reference and normalization of performance



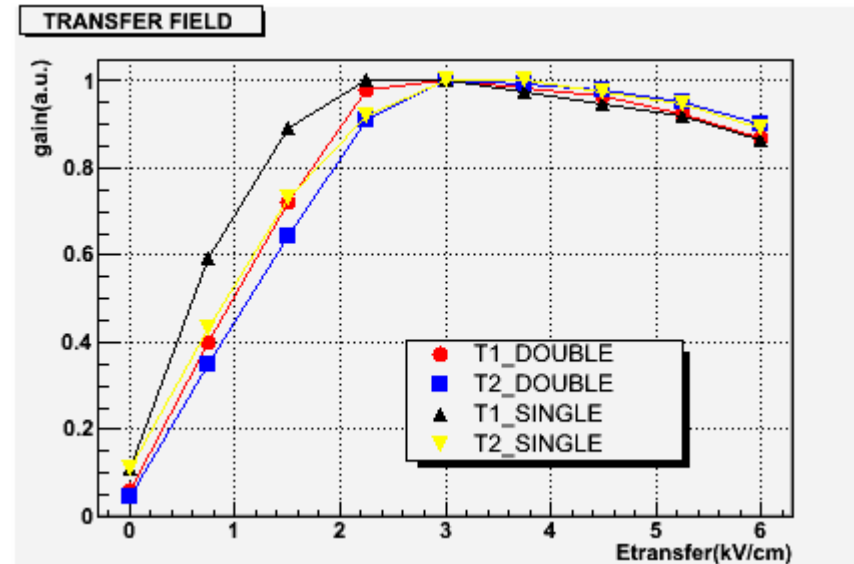
2. Electron transparency vs different gap fields

(to optimize operating parameters)

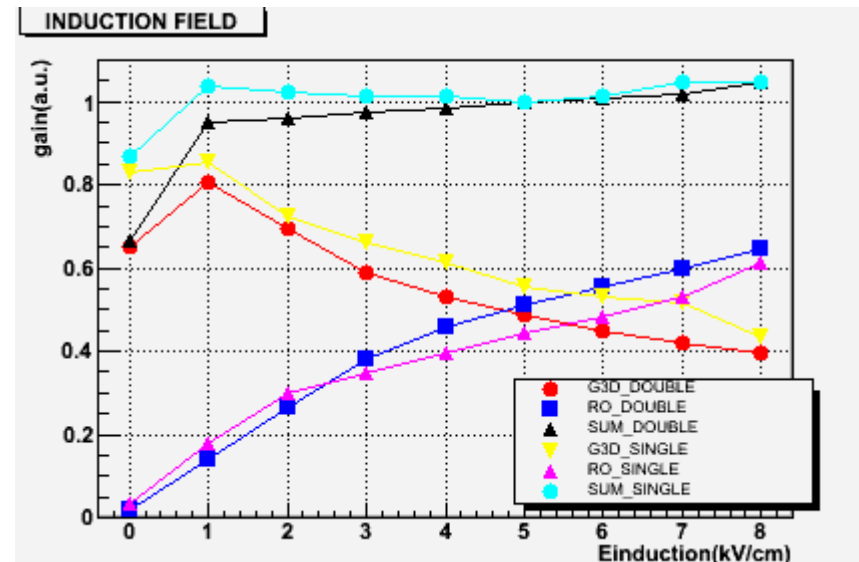
Only slight difference with standard GEM due to different hole shape



Operating fields values:
 1.0 – 3.0 – 3.5 – 6.5 kV/cm-SINGLE
 1.0 – 3.0 – 3.0 – 5.0 kV/cm-DOUBLE
 (Drift – Transf1 – Transf2 – Induction)

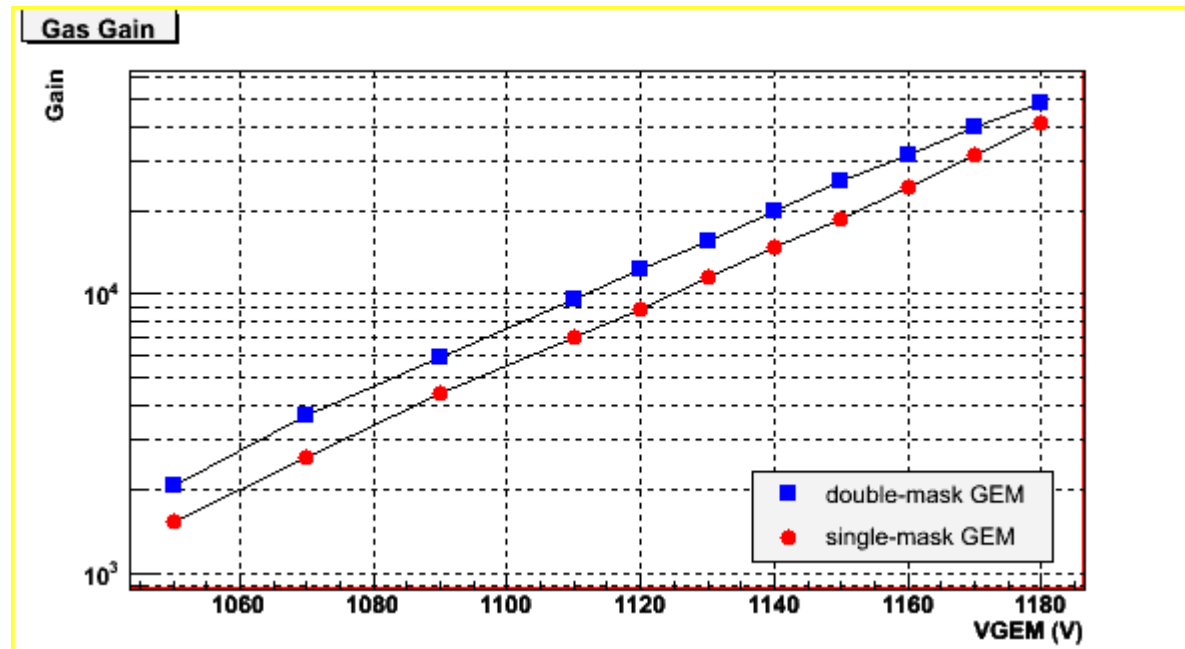


GEM POLARIZATION:390/380/370



3. Test of gas gain

- Gain slightly lower wrt standard GEM due to minor charging-up effect
 - Only ~20 V increase in the operating voltage needed to reach same gain
 - NO discharge observed up to 40000 gain



Very satisfactory operation